

CORNELL
UNIVERSITY
LIBRARY



BOUGHT WITH THE INCOME
OF THE SAGE ENDOWMENT
FUND GIVEN IN 1891 BY
HENRY WILLIAMS SAGE

THE
NATURAL HISTORY
OF
BRITISH INSECTS;

EXPLAINING THEM
IN THEIR SEVERAL STATES,
WITH THE PERIODS OF THEIR TRANSFORMATIONS,
THEIR FOOD, ŒCONOMY, &c.

TOGETHER WITH THE
HISTORY OF SUCH MINUTE INSECTS
AS REQUIRE INVESTIGATION BY THE MICROSCOPE.

THE WHOLE ILLUSTRATED BY
COLOURED FIGURES,
DESIGNED AND EXECUTED FROM LIVING SPECIMENS.

BY E. DONOVAN, F.L.S.

VOL. XI.

LONDON:

PRINTED FOR THE AUTHOR,

And for F. C. and J. RIVINGTON, N° 62, ST. PAUL'S CHURCH-YARD.

MDCCCVI.

THE

NATURAL HISTORY

DL466
D68
v.11

9591

E2281H

A. 456383

Sage



P L A T E DLI.

PHRYGANEA INTERRUPTA.

BROKEN-BAR PHRYGANEÆ.

NEUROPTERA.

GENERIC CHARACTER.

Mouth with a horny short curved mandible: feelers four: stemmata three: antennæ setaceous, longer than the thorax: wings equal, incumbent, lower ones folded.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings black, with an interrupted white band of dots near the middle, and white dot on the anterior margin nearer the tip.

PHRYGANÆA INTERRUPTA: nigra alis nigris: fasciis quatuor niveis; anticis interruptis, posteriori marginali punctata.
Fabr. Ent. Syst. T. 2. p. 79. 25.



Common among willows on the banks of rivers and rivulets in various parts of Britain. Frequent about Plymouth, and on the banks of the Dee. Fabricius describes it as a native of England.

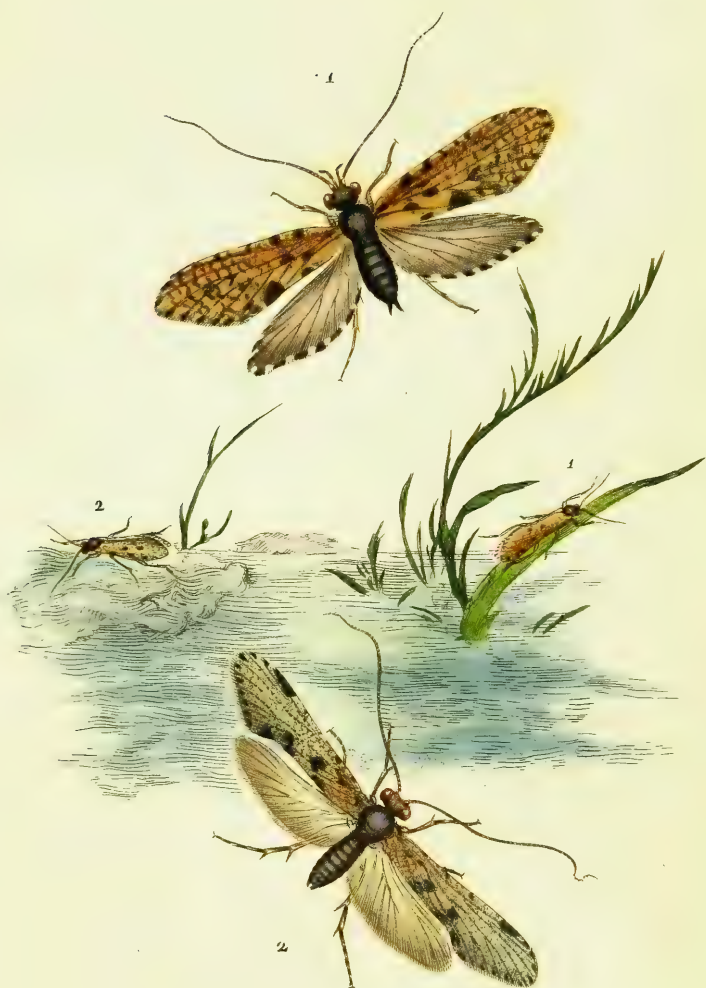


PLATE DXLVIII.

FIG. I. I.

PHRYGANEA MONTANA.

MOUNTAIN SPRING-FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth with a horny short curved mandible: feelers four: stemmata three: antennæ setaceous, longer than the thorax: wings equal, incumbent, and the lower ones folded.

SPECIFIC CHARACTER

AND

SYNONYMS.

PHRYGANEA MONTANA. Anterior wings testaceous with daubs and confluent transverse marks of fuscous: posterior wings pale, border with alternate fuscous and pale spots.



Found abundant on the borders of rocky mountain streams in Wales, and similar situations in Ireland and other parts of Britain. The smallest figure, as in the following species, denotes the natural size.

FIG.

F I G . I I . I I .

P H R Y G A N E A M A C U L A T A .

S P O T T E D S P R I N G - F L Y .

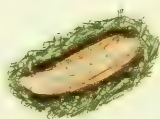
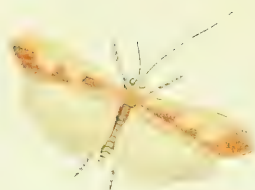
SPECIFIC CHARACTER

A N D

SYNONYMS.

P H R Y G A N E A M A C U L A T A : Anterior wings pale testaceous towards the base, and faintly reticulated with dusky : dorsal edge with four distinct dark spots, and a series of dark dots next the border at the apex.

A new species, found in tolerable plenty on the rivers of Cumberland and Devonshire.



P L A T E CCXX.

PHRYGANEA RHOMBICA.

SPRING FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth furnished with four palpi. Antennæ longer than the Thorax. First Wings laid horizontally on the body. Under Wings folded, and concealed beneath.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings greyish brown. First pair marked with rhombic whitish spots.

PHRYGANEA RHOMBICA alis griseis: macula laterali rhombica alba.

Linn. Syst. Nat.—Fab. Ent. Syst. T. 4. p. 77. 13.

Roes. Inf. 2. Aqu. 2. tab. 16.

Schæff. Icon. tab. 99. fig. 5. 6.

The Phryganea undergo their transformations in the water: in the larva state they are taken by the fishermen for bait; and, in some parts of Holland, are found so abundant, that they are used as a cheap manure for the land. In the larva state, they gene-

rally form a sort of covering, or tube, for their defenceless bodies. It is open only at one end, at which its head and fore legs are protruded, to take its prey. Some species form these coverings of weeds and small shells, gravel, sand, &c. That of our present species, is composed of little pieces of the stalks of grass, cut into an even form, and laid transversely on each other. It attaches this tube to the roots of some aquatic plants, and undergoes its transformations in it. In the annexed plate, we have represented the larva taken from the tube, and the pupa having the tube opened to exhibit its situation therein.

The Fly is very common about ponds, rivers, and marshy places.



P L A T E LXXXI.

LIBELLULA DEPRESSA.

NEUROPTERA.

GENERIC CHARACTER.

Wings four. Naked, transparent, reticulated with veins or nerves.
Tail without sting.

SPECIFIC CHARACTER.

Eyes brown. Head and thorax greenish, with two yellow transverse lines. A dark spot on the exterior margin of the wings. Body rather depressed; that of the female, bright brown with yellow marks on each division; that of the male, blue grey, with similar marks of yellow.

Syst. Ent. 420. 2.

Linn. Syst. Nat. 2. 902. 5.—*Fn. Sv.* 1413.

Libellula, &c. *Geoff. Inf.* 2. 226. 9.

Libellula, &c. *Raj. Inf.* 49. 5.

Reaum. Inf. 6. *Tab.* 35. *Fig.* 1.

Roef. Inf. 2. *Aqu. Tab.* 6. *Fig.* 4.

Tab. 7. *Fig.* 3.

Edw. Av. Tab. 333.

The Male Insect of the *Libellula Depressa*, differs so very materially in colour from the female of that species, that we cannot imagine it will be improper to give a figure of the former in our present

Number, though the latter is already represented in the early part of the Work.

We have nothing particular to add to our former account of its history. In the larva and pupa state, it is found crawling at the bottoms of pools or ditches, and subsists on the larvæ of Gnats and other Insects; but in the last state, it leaves its aquatic abode, and subsists on small winged insects, especially Moths; it is not uncommon to see one of this species stop short in its flight, dart down like a Hawk upon a Moth or Butterfly, and tear it to pieces in an instant; or fly with it in its mouth, to some more convenient place to devour it.

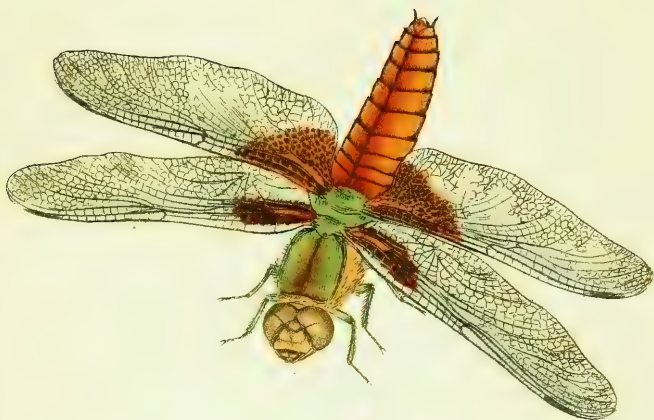


PLATE XXIV.

LIBELLULA DEPRESSA.

DEPRESSED DRAGON FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with jaws, more than two in number; lip trifid: antennæ very thin, filiform, and shorter than the thorax: wings expanded: tail in the male furnished with a forked process.

SPECIFIC CHARACTER.

All the wings blackish at the base: abdomen depressed, and yellowish at the sides, the middle in the male blue, in the female reddish brown.

LIBELLULA DEPRESSA: alis omnibus basi nigricantibus, abdomine depresso lateribus flavicantè. *Fabr. Sp. Inf.* 1. p. 519. n. 2.—*Mant. Inf.* 1. p. 236. n. 2.—*Gmel. Syst. Nat.* 2621. 5.

All the species of *Libellulæ*, but particularly the larger kinds, are considered by many as objects of terror, and the vulgar denomination of *Horfe Stingers*, the name by which they are generally known, contributes not a little to the prejudice against them. They

have

have not, however, as is commonly believed, any other power over that noble and useful animal than to alarm him, by fluttering round him when he seeks the water to refresh himself in hot or sultry weather. Among the insect race the *Libellulæ* are indeed mischievous, and seem to occupy among them the same station as the vulture tribe among the feathered part of the creation: they attack all with ferocity, and destroy more for the sake of sport than the voracity of their appetites can possibly require as food.

The Fly appears on the wing in May and June, in almost every marshy situation: the female lays her eggs near the roots of osiers on the banks of ditches, or sinks them into the stalks of rushes standing in the water: they hatch, and an ugly apterous insect, of a brown colour, comes forth: it has a long body like the Fly, six legs, a forked head, a sharp spine at the extremity of the abdomen, and a row of spines on each side, one at every joint. This creature immediately on being hatched plunges into the water, and proceeds to devour such of the inhabitants or their eggs as come within its reach, and it continues this life of depredation, through the pupa as well as larva state. Insects of this kind are to be caught by means of a small hand net; in the winged state they are taken with difficulty, as they fly, or rather dart, with a degree of velocity that renders all pursuit fruitless, should they evade the first attempt of the collector to capture them.





P L A T E XLIV.

T H E L A R V A

O F T H E

L I B E L L U L A D E P R E S S A ,

In Plate 24 of this work we have represented the *LIBELLULA DEPRESSA* in the winged state, and our present Figure is, of the Larva of that Insect. We have before described it as a savage voracious creature in every state of its existence. The Larva, which is an aquatic, feeds on Insects of that element; and when it becomes adult, Moths, Butterflies, and other winged Insects are its prey. As Lepidopterous Insects are not provided with any weapons, defensive or offensive, it will encounter the largest, grasp them in its claws, and tear them to pieces. Its mouth is spacious, and well adapted for that purpose.

The Larvæ of most winged Insects pass to the Aurelia, or Chrysalis state, and thence produce the Fly; but the Larvæ of the *Libellulæ* never undergoes that change, and though its appearance is altered several times in its progress to perfection, it does not become dormant. When the ultimate period of its last change arrives, it crawls to the bank, or side of the ditch, and affixing its legs firmly to the ground, or grass, it collects all its strength, and by one violent effort the future between the Thorax and Abdomen is broken, whence the Head and Thorax is protruded; after some pause the exuvia is cast off, and the Wings, which were before enwrapped in the short cases at the bottom of the Thorax, expand. The creature now entirely formed for flight, only waits a short time to exhale the superfluous moisture, and then rushes into the air, to spread havoc and disorder.



PLATE CCCCXV.

LIBELLULA ÆNEA.

BRASSY-GREEN DRAGON-FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifid: antennæ shorter than the thorax, very thin, and filiform: wings expanded: tail of the male furnished with a furcated process.

SPECIFIC CHARACTER

AND

SYNONYMS,

Wings transparent: thorax brassy-green.

LIBELLULA ÆNEA: alis hyalinis, thorace viridi æneo. *Linn. Fn. Suec.* 1466.—*Gmel. Linn. Syst. Nat.* 2622. n. 8.

Fabr. Spec. Inf. I. p. 524. n. 27.

Libellula viridi aurata capite rotundato, pedibus nigris, abdominis medio inflato. *Degeer. Inf.* 2, 2. 52. tab. 19. fig. 8.

Libellula viridi nitens, alis pallidis, pedibus nigris. *L'Amianthe. Geoffr. Inf.* 2. 226. 10.

Roef. Inf. 2. aqu. 2. t. 5. f. 2.

Schæff. Ic. t. 113. f. 4.

Raj. Inf. p. 49. n. 5.

Libellula

Libellula Aenea has been recently observed in swampy grounds in the neighbourhood of Hampstead. It is recorded as a British Insect by Ray; but since his time appears to have become very scarce till lately, when a small number of them were observed in the above-mentioned situation. We possess two varieties taken in this place, in the summer of 1805, which differ in some flight particulars only. Both insects have the eyes of a brown colour, and the thorax of a brilliant green with a brassy lustre: the principal difference consists in the colour of the wings, which in one specimen are hyaline, while on the contrary the wings of the other are tinged with testaceous yellow. This yellow-winged variety is further distinguished by having the body glossed with fine golden purple; in the other, the body is of a brassy green colour, with only a slight inclination to reddish brown*. Both insects are figured in the annexed plate in their natural size.

This species is not peculiar to England. Linnæus describes it as a native of Sweden; from Geoffroy we learn, that it is a native of France; and from Roefel, as being found in Germany.

* An indifferent figure of a species of *Libellula*, much resembling this, occurs in the work of Schaeffer, *Icon. Ratif. pl. 167, fig. 4*, and which is probably intended for our yellow-winged variety.



PLATE CCCCXXX.

LIBELLULA BOLTONII.

BOLTON's DRAGON-FLY.

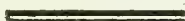
NEUROPTERA.

GENERIC CHARACTER.

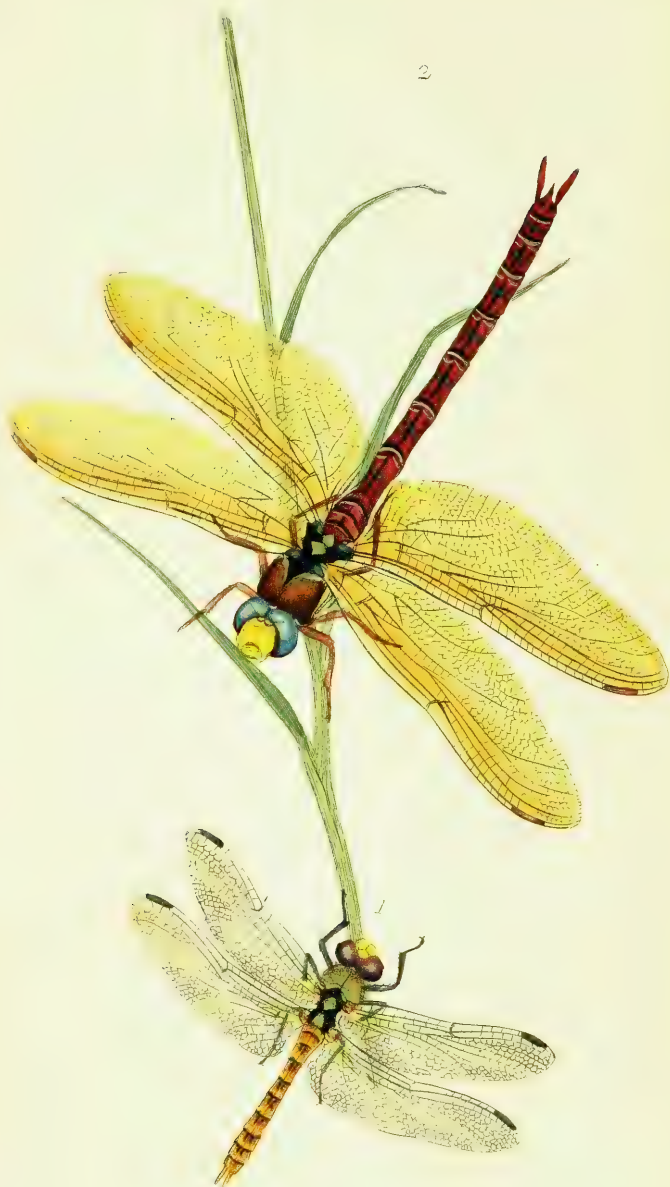
Mouth armed with more than two jaws: lip trifid: antennæ shorter than the thorax, very thin and filiform: wings expanded: tail of the male furnished with a furcated process.

SPECIFIC CHARACTER.

LIBELLULA BOLTONII: wings hyaline: body elongated, black, with a larger interrupted yellow band across the middle, and a smaller near the tip of each segment.



This fine and noble species of *Libellula* appears to be unknown to any of the entomological writers we are acquainted with. The specimen from which our figure in the annexed plate is taken, was discovered in Yorkshire some years ago by Mr. Bolton, and communicated to Mr. Drury, in whose cabinet it has remained unnoticed till the present time. We believe this specimen to be unique, or at least we have never seen an other. It is a beautiful, large, and interesting species, and possesses characters so extremely different from any of the known species of its genus, that it cannot easily be mistaken. We name it *Boltonii*, in compliment to Mr. Bolton, the gentleman to whom we are indebted for its discovery.



P L A T E CCCXXXVII.

LIBELLULA VULGATA.

COMMON DRAGON FLY.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifold: antennæ shorter than the thorax, thin and filiform: wings expanded without folds: tail of the male furnished with forceps.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings transparent: abdomen cylindrical and reddish.

LIBELLULA VULGATA: alis hyalinis, corpore cylindrico rufo.

Linn. Syst. Nat. 2. 901. 3.—*Fn. Sv.* 1461.

Roef. Inf. 2. *Aquatic.* 2. *tab.* 8.



This is the most abundant species of the Libellula tribe; frequenting ditches and other watery places during summer. The colours in different specimens vary exceedingly.

FIG. II.

LIBELLULA GRANDIS.

SPECIFIC CHARACTER.

Wings yellowish: Abdomen cylindrical, and variegated, with four yellow lines on the thorax.

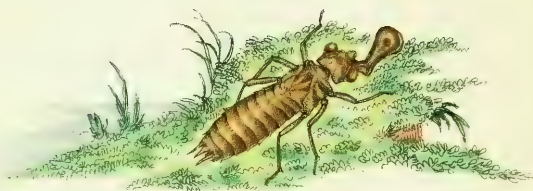
Libellula fulva alis flavescentibus, thoracis lateribus lineis duabus flavis, fronte flavescente cauda diphylla. *Geoff. Inf. 2. 227. 12.*

LIBELLULA GRANDIS: alis glaucescentibus thoracis lateribus lineis quatuor flavis. *Linn. Syst. Nat. 2. 903. 9.—Fn. Sv. 1467.*

Libellula fusca capite rotundato, thorace lineolis quatuor transversis luteis, alis flavicantibus, abdomine cylindrico. *Degeer. Inf. 2. 2. 45. tab. 20. fig. 6.*

When the fine species of *Libellula grandis* was figured in plate 166 of this work, we were not in possession of the variety with yellow wings which Linnæus describes. It has since been discovered in the neighbourhood of Battersea, and we deem it too interesting to be omitted.

The yellow colour of the wings can by no means induce us to think it a distinct species from the variety with wings perfectly transparent, especially as the same variation is observed in most other species of the same tribe, and particularly amongst the English species, as in *flaveola*, *virgo*, and *puella*. The marks and colours of the abdomen and thorax are still more liable to variation, and can scarcely furnish any precise character for a specific difference.



P L A T E C C C C X X I I I .

LIBELLULA FORCIPATA.

FORCIPATED DRAGON-FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws : lip trifold : antennæ shorter than the thorax, very thin and filiform : wings expanded : tail of the male furnished with a furcated process.

SPECIFIC CHARACTER

AND

SYNONYMS.

Thorax greenish yellow, with black lines : abdomen blackish with yellow characters.

LIBELLULA FORCIPATA : thorace luteo-virescente, lineis nigris ; abdomine nigricante characteribus flavis. *Linn. Fn. Suec. n. 771.*

Gmel. Linn. Syst. Nat. 2625. n. 11.

ÆSHNA FORCIPATA : thorace nigro : characteribus variis flavescens, cauda unguiculata. *Fabr. Ent. Syst. T. 2. p. 383. n. 1.*

Libellula nigra capite rotundato, thorace segmentisque aliquot abdominis viridi maculatis. *Degeer. Inf. 2. 2. 50.*

Libella major, corpore compresso flavescens. *Petiv. Mus. 84. n. 819.*

Libella maxima lutea, cùm 4 vel 5 spinis in extremitate caudæ.

Merret Pin. 197. n. 4.

La Caroline. Geoffr. Inf. t. 2. p. 228. Sp. 15.

This is an interesting, rare, and elegant species of *Libellula*. In the cabinet of the late Mr. Drury, we have a single specimen of this scarce insect; another has been recently taken near Highgate, and is likewise in our possession. Like the rest of its tribe it is found in swamps and other watery places. The larva is unknown to us, its pupa is represented with the perfect insect in the annexed plate.

The head of this species of *Libellula* is of a fine yellow, faciated with black: the eyes prominent, brown, and glossy: the thorax greenish yellow, lineated with black; the abdomen black with a longitudinal interrupted dorsal line of whitish yellow, and the middle segments marked on both sides with a short transverse yellowish band, and a semi-lunar mark of the same colour below it: the wings transparent, with a dark anterior costal mark, as in most other of the *Libellula* tribe



Libellula fusca, capite rotundato, thorace lineolis quatuor transversis luteis, alis flavicantibus, abdomine cylindrico.

Degeer. Inf. 2. 2. 45. tab. 20. fig. 6.

Libellula maxima vulgatissima, alis argenteis. *Raj. Inf. 48. 1.*

Roef. Inf. 2. Aqu. 2. tab. 2. fig. 1. 2?

Schæff. Icon. tab. 2. fig. 4.

Act. Nidros. 3. 412. tab. 6. fig. 9.

If we except a very small number of exotic *Libellulæ*, *L. Grandis* is the largest insect of the genus known: it is certainly the largest of the European species.

It is not uncommon in woods; but never flies far from the water. In the larva state it lives in the water, and, like others of the same genus already described in this work, does not quit it till it becomes a winged creature. In the larva state it also resembles in its manners those voracious insects that devour smaller insects, and in the winged state it takes moths and other weak insects in its flight. Is found in most of the summer months.



P L A T E CCCCLXXII.

LIBELLULA CANCELLATA.

CANCELLATED DRAGON FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with jaws, more than two in number: lip trifid: antennæ very thin, filiform, and shorter than the thorax: wings expanded: tail of the male furnished with a forked process.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings immaculate at the base: abdomen on the back and sides interrupted with yellow.

LIBELLULA CANCELLATA: alis basi immaculatis, abdomine, dorso lateribusque interrupte luteis. *Linn. Fn. Suec.* 1465.—*Syst. Nat.* 12. 544.—*Fab. Spec. Inf.* 1. p. 522. n. 15.—*Mant. Inf.* 1. p. 337. n. 15.

The description which the work of Linnæus affords of his *Libellula Cancellata* is remarkable for its brevity, and as he refers to no other authority, some distrust might arise as to the identity of the insect intended, were it not materially different from the other European species; inasmuch, indeed, that it cannot easily, we should imagine, be

confounded with any other: the description, though concise, is expressive, and perfectly applicable to the insect before us. Fabricius speaks of the species only in the words of Linnæus.

There is a figure of one of the *Libellulæ* in the work of Sulzer, given under the name of *Cancellata*, which nearly resembles the present insect, but is scarcely more than half its size; and this figure is repeated from the same plate in the work of Roemer, but neither is referred to by Fabricius. The magnitude of *L. Cancellata* is not specified; the figure appears to be tolerably correct, so far at least as to be understood, and we should rather suspect it to be a dwarf example of the same insect.

The "*Icones Inf. circa Ratibon.*" of Schæffer, plate 137, fig. 1. presents another representation, if we mistake not, of the species *Cancellata*, in size approaching much nearer to the specimen delineated in the annexed plate. It appears without any specific name, as usual, in that work. These are the only figures we at present recollect, that, in our opinion, are to be esteemed synonymous.

This interesting insect is delineated from a specimen in the cabinet of Mr. W. Leach, F. L. S.



P L A T E D X X I I I

LIBELLULA SCOTICA.

SCOTCH LIBELLULA.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifid: antennæ very thin, filiform, and shorter than the thorax: wings expanded: tail of the male furnished with a forked process.

SPECIFIC CHARACTER.

LIBELLULA SCOTICA. Thorax with two oblique yellow bands.

Male. Wings transparent with deep black stigma: abdomen blackish.

Female. Wings transparent with deep black stigma, and yellow base: abdomen yellow, with two black lines on each segment.

We have been recently favoured with specimens of this new species of *Libellula* by W. E. Leach, Esq. from whom it received the trivial name of *Scotica*, in reference to the country in which it appears only to have been hitherto discovered. This gentleman informs us it is common in the bogs of Scotland: he first observed it near Lock-awe,
in

in Argyleshire, and afterwards in the bog of Bannock-bourn, in which latter place it occurs in great abundance.

Libellula Scotica is an insect of the middle size, in general appearance resembling the species *vulgata*. The male is uniformly dusky, except the wings, which are transparent: the female is more remarkable for its gaiety, the head, thorax, and abdomen being yellowish, varied with brown, and little lines of black; and the wings transparent, with the base yellow.



PLATE CCCCVII.

LIBELLULA QUADRI-MACULATA.

4-SPOT DRAGON-FLY.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifold: antennæ shorter than the thorax, very thin and filiform: wings expanded: tail of the male furnished with a furcated process.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings with two dark costal spots on each: and a large brown spot at the base of the lower pair: abdomen depressed and downy.

LIBELLULA QUADRIMACULATA: alis posterioribus basi omnibusque medio antico macula nigricante, abdomine depresso tomentoso. *Linn. Fn. Suec.* 2. 1459.—*Gmel. Linn. Syst. Nat.* 2619. n. 1.

LIBELLULA 4-MACULATA: alis posticis basi omnibusque medio antico macula nigricante, abdomine depresso tomentoso. *Fabr. Syst. Ent. T. 2. p. 373. n. 1.*

Libellula alis macula duplici marginali. *LA FRANÇOISE. Geoffr. Inf.* 2. 224. 6.
Reaum. Inf. 6. tab. 35. fig. 1. 2.

Geoffroy speaks of this species of Dragon-fly as a rare insect in France, and we believe it to be very uncommon in England. The only specimen we have seen is one we possess in the cabinet of Mr. Drury, but from whence he obtained it we cannot ascertain. Ray appears to have described this insect as a native of Britain*.

This species bears some resemblance to the female of *Libellula Depressa*†, in size and general appearance; but on the slightest inspection will be found entirely distinct. The abdomen is less depressed on the back and narrower, and being besides somewhat compressed at the sides, assumes a much more linear form in the middle than *Libellula Depressa*. The wings are totally different, and afford an excellent characteristic by which the species may be distinguished. Each of those wings are marked on the anterior or costal rib, with two small brown spots, the one of which is situated near the apex, as in most of the tribe; the other about the middle on the anterior part of each wing: all the wings are yellowish at the base, and in the posterior pair, that part is distinguished further by having a large brown spot contiguous to the body.

* *Ray Inf. p. 49. n. 3.*

† *Brit. Inf. Vol. I. pl. 24.*



PLATE CCCCXXV.

LIBELLULA QUADRIFASCIATA.

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifid: antennæ shorter than the thorax, very thin and filiform: wings expanded: tail of the male furnished with a furcated process.

SPECIFIC CHARACTER.

LIBELLULA QUADRIFASCIATA: wings white, tinged anteriorly with yellowish: tips of all the wings, and base of the posterior pair with a fuscous band.

This evidently new species of *Libellula* occurs in the cabinet of Mr. Drury: it corresponds in some respects with *Libellula Quadrimaculata* (See Plate 407), the size and general aspect of both insects is nearly the same, but the present species differs among other particulars in having a fuscous band at the tip of all the wings. *Libellula Rubicunda* also bears some resemblance to this insect, except that the tips of the wings are perfectly immaculate, as in *Libellula 4-maculata*.—Our new species *Libellula Quadrifasciata* is a very rare insect, and has not been noticed by any author.



P L A T E C C C C X L I X .

LIBELLULA BIGUTTATA.

BIMACULATED DRAGON FLY.

NEUROPTERA.

Mouth armed with jaws, more than two in number; lip trifid: antennæ very thin, filiform, and shorter than the thorax: wings expanded: tail of the male furnished with a furcated process.

SPECIFIC CHARACTER.

LIBELLULA BIGUTTATA. Abdomen depressed and narrow; the first joint marked in the middle with two small yellowish spots.

A small brood of this curious species of Dragon fly was discovered about eight years ago in a marshy ground at Hampstead, since which time they have entirely disappeared. It is neither described by Linnaeus or Fabricius, nor by any other writer we are acquainted with.

This new species is allied in its general aspect to the *Libellula depressa*: the abdomen as in that insect is flat, and rising into a longitudinal ridge along the middle, but is considerably narrower in proportion, and this circumstance is alone sufficient to prove that it is of a different species. The pale yellowish spots on the first joint of the abdomen at the base is also a striking character: two of these spots are placed contiguous to each other on the back, and two others appear one on each

side, but so close to the lateral edge as to escape attention unless inspected closely. A similar lateral spot is perceptible likewise a little below these, neither of which are however so conspicuous as the two dorsal spots first mentioned. The wings are transparent with a common oblong testaceous stigma at the costal margin near the tip.

Libellula biguttata is represented in its natural size in the annexed plate.



PLATE XXXVI.

FIG. I.

LIBELLULA VIRGO. *var.*

NEUROPTERA.

GENERIC CHARACTER.

Mouth armed with more than two jaws: lip trifid: Antennæ very thin, filiform and shorter than the thorax: wings expanded: tail of the male furnished with a forked process.

SPECIFIC CHARACTER.

Wings coloured.—*Var.* Body shining blue green: wings bluish in the middle: margin immaculate.

LIBELLULA VIRGO β . Corpore sericeo nitido, alis viridi-cæruleiscentibus apice fuscis margine immaculatis. *Linn. Fn. Suec. L. 757.*

It is neither so large as to create terror by its appearance, or so beautiful as to claim the first place in a collection of British insects: notwithstanding there are many inferior to it both in elegance, and colour. The whole of the body is a deep purplish blue, which reflects on one part, a most brilliant colour with a greenish cast, and the clouds on the wings contribute much to its lustre. The Thorax and Head are nearly the same, some few shades of green excepted.

It

It is found in *May* and *June*, sporting on the waters, or among the bushes which overgrow the sides of pools, or gently flowing streams; at noon, or after a shower, when the sun breaks from its watery prison, and penetrates the thickets, and the groves with inviting warmth, they are seen issuing from the dark retreat, and overhanging shrubbery; to bask and wanton in its effulgent beams. In many parts on the banks of the *Thames* they heighten the scene by the glow and richness of their colouring; the green, the blue, and the red; the yellow, purple, and the brown, in their richest tints, according to the variety; and as they fly in various directions, display themselves in all their native elegance and splendor.

FIG II.
LIBELLULA P U L L A.
RED VARIETY.
SPECIFIC CHARACTER
AND
SYNONYMS.

Body red with yellow and black lines at each segment: thorax green with yellow lines: wings with marginal spots.

LIBELLULA PUELLA β . Corpore incarnato, alis puncto marginali fusco. *Linn. Fn. Suec.* 8. n. 761.

The body is red, with a yellow band and black mark at every segment; the Thorax green, with longitudinal lines of yellow; the Wings are perfectly transparent, except a marginal spot on each. It is voracious, as are all the species of *Libellula*, whether in the larva or the winged state; it appears about the same time as the preceding, and is the produce of an aquatic larva.



P L A T E CXXVIII.

EPHEMERA VULGATA.

COMMON EPHEMERA, or MAY-FLY.

NEUROPTERA.

Wings 4. Naked, transparent, reticulated with veins or nerves. Tail without a sting.

GENERIC CHARACTER.

Antennæ very short. Two protuberances before the eyes. Wings erect. Second pair small. Two or three tails like bristles. Short lived.

SPECIFIC CHARACTER.

Wings reticulated, brownish with five or six brown spots. Body yellowish, with black specks. Three tails.

EPHEMERA VULGATA: cauda trifeta, alis nebuloso maculatis.
Linn. Syst. Nat. 2. 906. 1. Fn. Sv. 1472.

In the larva and pupa state, this Insect is found under loose stones at the bottom of shallow pools; in the winged state it frequents the water.

We have several species of this genus in England. The *Ephemera Vulgata*, is the largest among them. A very distinguishing character of them is the shortness of their lives, which seldom exceeds a few hours. In the month of May these Insects are seen in great plenty on the water, where they are greedily devoured by the fish; anglers say, when the large *Ephemera* appears, the trout will snap at no other bait, than the artificial fly made after its form.—In some specimens the wings are more clouded, and the tails longer than in others.





P L A T E CCI.

PANORPA COMMUNIS.

NEUROPTERA.

GENERIC CHARACTER.

Mouth lengthened into a cylindrical horny proboscis: feelers four, nearly equal: stemmata three: antennæ filiform, longer than the thorax: tail of the male armed with a chelate appendage; that of the female unarmed.

SPECIFIC CHARACTER

AND

SYNONYMS.

Wings equal length, spotted with black.

PANORPA COMMUNIS: alis æqualibus nigro maculatis. *Lin. Syst.*

Nat. 2. 915. 1.

Fn. Sv. 15. 16.

Geoff. Inf. 2. 260. 1. *tab.* 14. *fig.* 2.

Degeer. Inf. 2. 2. 86. *tab.* 24. *fig.* 3. 4.

Reaum. Inf. 4. *tab.* 8. *fig.* 9.

Sulz. Hist. Inf. *tab.* 25. *fig.* 5. 6.

Schæff. Icon. *tab.* 88. *fig.* 7.

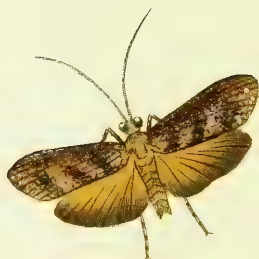
The *Panorpa communis* is very common in fields in the summer. Its metamorphosis is entirely unknown.

The tail of the male is armed with a weapon, somewhat resembling the sting of a scorpion. The tail of the female has an appendage, but very different in its structure. Those parts of both sexes are represented in our plate, of the natural size, and magnified,

2



1



P L A T E CCLXXVII.

F I G. I.

P H R Y G A N E A V A R I A.

N E U R O P T E R A.

G E N E R I C C H A R A C T E R.

Mouth furnished with short, arched, acute, horny mandibles: jaws membranaceous: feelers four: stemmata three: antennæ setaceous, and longer than the thorax: wings incumbent, posterior pair folded.

S P E C I F I C C H A R A C T E R.

Wings cinereous, variegated with black, and marked in the middle with a distinct white spot: antennæ black.

P H R Y G A N E A V A R I A : alis cinereo, nigroque variis; puncto medio distincto niveo, antennis nigris. *Fab. Ent. Syst. T. 2. p. 77. 103. ?*

The *Phryganea Varia* of Fabricius has not been figured by any author; but is, we suspect, no other than a small variety of *P. Grandis*, and which Linnæus describes as “*alis cinereo testaceis, lineolis duabus longitudinalibus nigris, puncto albo.*” Fabricius has altered this definition to “*alis testaceis cinereo maculatis,*” in the *Entomologia Systematica*, and erroneously attributes the latter to Linnæus.

We cannot avoid, in support of our opinion, noticing the striking dissimilarity between the several figures of *Phryganea Grandis*, in our copies of the works quoted by Linnæus and Fabricius. *Roefel* has two figures, one of a blueish grey, the other
G
yellowish

yellowish brown; both vary in the markings, and are nearly twice the size of our specimen. In *Sulzer*, the wings are shorter and more pointed than in the preceding work; and are rather pellucid and tinged with yellow: the marking totally different from those in *Roefel*. Those in *Schæffer* are most like one of our specimens in form and reddish colour, but still with markings as different from it as from either of the preceding figures. We may hence conclude the marks are inconstant, and the colours extremely variable; and that in point of size, the present species may be the *Varia* of *Fabricius*, since he notices its affinity to the *P. Grandis*; and adds, it is rather smaller.—“*Nimis Affinis P. Grandis at paullo minor.*” *Fab. Ent. Syst.*

FIG. II.

HEMEROBIUS PERLA.

GOLDEN EYE.

GENERIC CHARACTER.

Mouth with short horny mandibles: jaws cylindrical, straight: lip advanced and entire: feelers four, projecting, unequal, and filiform: no stemmata: wings deflected, and not folded: antennæ setaceous and advanced forward,

SPECIFIC CHARACTER

AND

SYNONYMS.

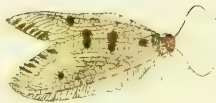
Yellow green: wings transparent with greenish base: eyes golden.

HEMEROBIUS PERLA: luteo viridis, alis hyalinis: basis viridibus.

Linn. Syst. Nat. 2. 911, 2.—*Fn. Suec.* 1504.

Extremely common in orchards and gardens during the summer. It is a very delicate little creature, of a greenish colour, with wings most elegantly reticulated, perfectly transparent, and beautifully glossed with prismatic tints of colour. The eyes are large and globular, and have the brilliant aspect of burnished gold, whence the English name of Golden Eye. They are said to sink just before a thunder storm.





P L A T E CLXXXVIII.

HEMEROBIUS CHRYSOPS.

NEUROPTERA.

Wings four, transparent, reticulated. Tail unarmed.

G E N E R I C C H A R A C T E R.

Mouth with a short horny mandible, the jaw cylindrical, straight and cleft: feelers four, unequal filiform: stemmata none: wings deflected, not folded: antennæ setaceous, projecting longer than the thorax.

S P E C I F I C C H A R A C T E R

AND

S Y N O N Y M S.

Greenish: wings transparent, reticulated, with dark spots.

HEMEROBIUS CHRYSOPS: viridi nigroque varius, alis hyalinis: venis viridibus; lineolis nigris reticulatis. *Linn. Syst. Nat.* 2. 912. 4.—*Fn. Sv.* 1505.

Geoff. Inf. 2. 254. 2.

Fab. Ent. Syst. 1. 2. 83. f. 6.

Frisch. Inf. 4. 40. tab. 23.

Roef. Inf. 3. tab. 25. fig. 4.

Sulz. Hist. Inf. tab. 25. fig. 1.

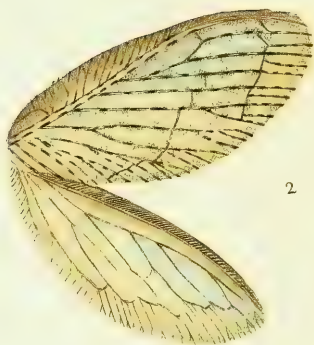
This Insect was formerly held in great esteem amongst the English collectors, on account of its rarity; and even within our knowledge the usual price for a single pair was half a guinea or upwards.

About

About the year 1790, they were taken in great plenty near London, both at Battersea and Highgate; and have been met with in other places since that time. Like the Ephemæræ, and other gauze-winged Insects, it delights in moist places, particularly among weeds. The larva is unknown, but is conceived to be of the aquatic kind.

The wings are the most pleasing objects for the microscope that can be imagined: the reticulations and feathery edges are so transparent, that they may be examined with the deepest magnifiers, which is an advantage few objects of such a size possess. The magnified figure is given, with the natural size in the annexed plate.

Fabricius has erroneously quoted the seventh and eighth figure of the fifth plate of *Schæffer's Icones*, which is certainly no other than the common kind, Hemorobius perla, an Insect often found in gardens, and remarkable for the fine golden colour of the eyes. The figure quoted in *Sulzer* and *Roesel* agree with our specimen.



P L A T E CXIII.

FIG. I.

HEMEROBIUS HIRTUS.

NEUROPTERA.

Wings four, naked, transparent, reticulated with veins or nerves.
Tail without a sting.

GENERIC CHARACTER.

Mouth prominent. Palpi four. Wings deflexed. Antennæ longer than the thorax, taper, extended.

SPECIFIC CHARACTER.

First wings transparent reticulated with brown veins, hairy. Veins fewer on the second wings.

HEMEROBIUS hirtus, alis albis fusco reticulatis, fasciis duabus fuscescentibus. *Linn. Syst. Nat.*

2. 912. 6.—*Fn. Sv.* 1507.

Degeer Inf. 2. 2 70. 12. tab. 22. fig. 4. 5.

This very common Insect is found on the nut tree, and oak. It conceals itself in the middle of the day among the foliage, or flies only in moist, shady places. It is always observed to be very brisk at the approach of a thunder storm, like the Hemorobius Perla, &c.

The nerves on the wings are so exceedingly delicate, that it is impossible to give an accurate representation of the natural size ; but to remedy that defect, we have shewn the magnified appearance of an upper and under wing at Fig. 2.

The wings are of a pale transparent brown ; which as the Insect moves in different directions reflect all the vivid colours of a Prism.



P L A T E CCCXV.

RAPHIDIA OPHIOPSIS.

NEUROPTERA.

GENERIC CHARACTER.

Head depressed or flat. Mouth armed with two teeth, and furnished with four palpi. Three stigmata. Wings deflected. Antennæ long as the thorax, anterior part of which is lengthened out and cylindrical. Tail of the female terminated by a flexible crooked bristle.

SPECIFIC CHARACTER.

Thorax cylindrical; a brown marginal spot on each wing.

RAPHIDIA OPHIOPSIS: thorace cylindrico, alis macula marginali fusca.

RAPHIDIA OPHIOPSIS. *Linn. Syst. Nat.*

Raphidia notata. *Fab. Spec. Inf.* 1. p. 402. 106. *sp.* 1.

Roef. Inf. 3. tab. 21. fig. 67.

Scopoli, Carn. 711.

Schæff. Icon. tab. 95. 1. 2.

———— *Elem. tab.* 107.

We can scarcely conceive what motive induced Fabricius to confound the *Raphidia Ophiopsis* and *notata* as one species in his last work, after having described both with accuracy in his former publication: it appears indeed, that his names were erroneous, and his synonyms misapplied; but it was needless to correct one error by committing another.

The

The first species of *Raphidiæ* known, was figured in the works of Roefel, *Die Fleine Landhaelfige. Lanlibelle* fig. 6. 7. pl. 21, it was described in the *Fauna Suecica*, by Linnæus, under the specific name *Ophiopsis*; and again in the *Systema Natura* of the same author, with a reference to the only figure of it then extant, that of Roefel. Hence it appears that the true *Raphidia Ophiopsis* of Linnæus, is that figured by this author. In later editions, the works of Sulzer, Schæffer, Geoffroy and Scopoli, were added to the synonyms, but the figures thus quoted, evidently include two species, one with wings perfectly clear, the other having a marginal black spot on each. Linnæus seems to have considered the two as varieties of the same species, but he is evidently mistaken, for the two sexes of both kinds are now clearly ascertained.

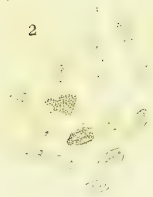
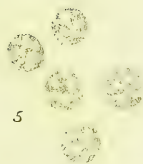
Fabricius has followed Linnæus in his *Species Insectorum*, has indiscriminately adopted all the synonyms, and thereby confounded all the figures of the two *Raphidiæ* that have been noticed by authors on European Insects, under the name of *Ophiopsis*: and after this he describes that very species which has spots on the wings as a new and unfigured kind, under the name of *notata*. *Thorace cylindrico alis macula marginali fusca. Habitat in anglia*. Had he referred to the volumes of Roefel, he must have known that his *notata* was the Linnæan *Ophiopsis*, and if either Insect was new, it must certainly be that destitute of spots.

Gmelin in his *Systema Natura* perpetuates the same error; he follows the *Species Insectorum* of Fabricius, and gives the characters thus: “*R. Ophiopsis alis immaculatis. Fab.*” & “*R. notata, alis macula marginali fusca. Fab.*” but whilst the works of Gmelin are preparing for publication, Fabricius alters his opinion; and in the last work. *Syst. Ent. emendet et aucta*, abolishes his specific characters, and merely says there is no difference between his former species “*Raphidia notata, nullo modo distincta.*” *Fab. Ent. Syst. T. 2. p. 99.*

As we have all the species described by those authors before us, we shall endeavour to restore them to order, and that by retaining the former descriptions of Fabricius, changing the names, and dividing the synonyms, for both are sufficiently characteristic; that with marginal spots is figured by Roefel, Schæffer and Scopoli, and the immaculated or clear-winged kind by Geoffroy and Sulzer. The first we deem the true *R. Ophiopsis*, and the latter as a distinct insect, which may be called the *Raphidia Immaculata* with propriety.

Both species of this singular creature are extremely rare. Geoffroy, speaking of the unspotted kind, says he never found it but twice, and then in woods*. The larva is unknown; in the pupa state it is furnished with legs, and runs fast.

* Geoffroy Histoire des Insectes.



P L A T E II.

F I G. I.

MONOCULUS QUADRICORNIS.

APTERA.

GENERIC CHARACTER.

Legs from four to eight, formed for swimming, and very long : body covered by a shell divided into segments : Antennæ either four, two, or none ; eyes one, or two, approximate and fixed in the shell : feelers four, and in continual motion when swimming : posterior ones very small and hooked.

SPECIFIC CHARACTER.

Antennæ four : tail straight and bifid ; the divisions ramose.

Although this insect may have been noticed by many, swimming, or rather darting swiftly in various directions in water ; its minuteness is such, that the most attentive could never have comprehended precisely its component parts. The microscope discovers it to be an animal of such singular formation as highly to deserve the attention of the naturalist. It is covered by a hard shelly substance, divided into annulations, and armed in several parts with spines and bristles ; notwithstanding which, this shell is so transparent that the whole motion of the intestines is very visible by a good magnifier.

It must be granted that, but for the microscope, the wonders of the minute creation, would be to us entirely unknown; our ideas could never suppose the existence of those animated forms which occupy the immeasurable space between an apparent atom and nothing. The myriads of animals, thousands of times smaller than a mite, must evade our cognizance, and be an actual conviction of their non-existence.

But with all the utility that the microscope can boast, no instrument is so likely to mislead the most accurate observer, particularly if not in the habit of using it; the variations of light, the difference of the magnifying powers, or the damage the glasses may meet with by accident, such as requires every one to examine with the greatest care; one degree of light may bring an object to view, whilst another may entirely blend it with the fluid it exists in; or one glass may discover spines on an object, another glass might have represented perfectly smooth; it is therefore necessary to begin with a small power, in proportion to the size of the object, and to proceed to deeper magnifiers after.

There is some difference in our figure, and those either of *Barbut*, or of *Baker*, which appears chiefly from our using a single lens nearly of the deepest power convenient to use. Our glasses were the 20th and 30th of an inch focus.

We very attentively examined the eyes, and found, not one, but two, placed near each other, on a scale or plate of a black colour; hence arises the appearance of a single eye by a small magnifying power.

The tail presents a forked appearance by a deep power, and the eggs are contained in two bags, one on each side the tail. The colour varies probably in proportion to the nature of its food, to pale green, more or less of a red, or of a grey brown colour.

F I G. II.

This minute animalcula is frequent in stagnant water, or in infusions of vegetables, and is one species of those whose existence can only be discovered by a good microscope. It is very difficult, considering the power those creatures have to distort their true form at pleasure, to fix their distinguishing character: therefore where the definition appears dubious, we prefer being silent rather than hazard an error.

FIG. 2. Represents them (*magnified*) as they sometimes seem to follow the leader in herds; but perhaps it is only the scent of the prey that induces each to follow the foremost, as they frequently swim or whirl in the water separately, with great swiftness, devouring the smaller kinds of animalculæ.

FIG. 3. Two, magnified by a deep power, when they appear to have feet or fins.

FIG. 4. Shews the strange form it assumes whilst depositing its eggs.

FIG. 5. The eggs deeper magnified.

2



3

P L A T E V.

F I G. I.

MONOCULUS CONCHACEUS.

APTERA:

GENERIC CHARACTER.

Legs from four to eight, formed for swimming, and very long: body covered by a shell divided into segments: Antennæ either four, two, or none; eyes one, or two, approximate and fixed in the shell: feelers four, and in continual motion when swimming: posterior ones very small and hooked.

SPECIFIC CHARACTER.

Shells ovate and downy.

To acquire a proper knowledge of the formation of this minute insect, it is necessary to use a microscope with a glass stage for objects, or rather such as admit of nicely adjusting a talc as occasion may require: the insect to be taken from the water with a camel-hair pencil, and carefully placed on the talc; after which it may be examined by a magnifier of $\frac{1}{16}$ of an inch focus; but in proceeding to a deeper power, let the talc be turned the upper surface with the insect in the drop of the fluid from the lens, and thereby the lens may approach the object to its proper focus; without this caution the lens would be frequently immersed in the water, and entirely obstruct the sight.

In the adult state, the opacity of the bivalve shell, its external covering, so entirely obscures the internal motion, that nothing, except the filaments it throws from the aperture or opening, is visible by the microscope.

It breaks from the egg perfectly formed, but very minute and transparent; this is therefore the best time to discover its structure, and from one in this state we have taken our figure.

By the antennæ it directs its course, as does the *Monoculus Quadricornis*; and like it also it hath two eyes fixed in the shell, but it can completely envelope its head in its bivalve covering; its mouth is beneath, but the numerous filaments it darts forth, causes such a violent motion in the water, that the minuter insects are unresistingly drawn between them, and forced to the mouth.

The motion of its lungs is very visible, as are also the vesse ramifying thence. Its food is carried to, and digested in the deep-coloured tube, or intestine, and the refuse is discharged by a sudden jerk from the extremity of the tube, or anus.

Thus it exists, a life of rapine and destruction, enjoyed at the expence of the lives of thousands; and as the objects of its ravenous disposition are defenceless, so they are the sport of their conqueror: the few moments of intermission its craving appetite grants them, is occupied equally in the spoil, first pressing them to death, and then tossing them undevoured into the fluid,

But should a more powerful insect oppose him, he immediately contracts his parts, and nothing more than the external covering is open to his antagonist's violence, and he will sooner die ignobly than offer the least opposition.

F I G. II.

This animalcule is very minute, and appears like a fine membrane without intestines before the microscope; from the appearance of its winged sides, it is supposed to resemble a bird. It is called *Bursaria Hirundinella*.

F I G. III.

The back and side view of an animalcule found in ditch-water on duck-weed, very pellucid, and singularly marked in the intestines; tail moveable, and thereby it directs its course.



P L A T E XL.

F I G. I.

VORTICELLA POLYMORPHA.

GENERIC CHARACTER.

A Worm, capable of contracting or extending itself, naked, with rotatory cilia.

Many-shaped Vorticella green, opaque.

It is impossible to describe the various forms those little Insects can assume; and, from the microscope, it is both doubtful and difficult to give a correct figure of it, as the activity of its motions and changes frequently misplace it from the verge of the focus. It is scarcely perceptible to the naked eye, and is generally of a green colour.

F I G. II.

VORTICELLA ROTATORIA.

SPECIFIC CHARACTER.

Cylindrical Vorticella, with a little foot projecting from the neck; a long tail, furnished with four points.

Of all the species of minute Insects, this Vorticella seems to have engaged the attention of the curious most. Baker has described

it under the title of *the Wheel Animalculum*, and hence it is well known. It is found in gutters, or leaden pipes, in the summer. This Insect possesses one property by no means common to larger animals, or even known of many of the minuter kinds; it lives in the water, but may be kept dry for months; and when again it is immersed in that element, it will regain its life and motion in half an hour.

F I G. III.

T R I C H O D A L Y N C E U S.

G E N E R I C C H A R A C T E R.

An invisible, pellucid, hairy Worm.

S P E C I F I C C H A R A C T E R.

Nearly square; with a crooked beak. The mouth hairy.

F I G. IV.

K E R O N A P A T E L L A.

G E N E R I C C H A R A C T E R.

An invisible Worm with horns.

With one valve, orbicular, chrystalline; the fore-part notched; the body lies in the middle of the shell: above and below are hairs or horns, of different lengths, jutting out beyond the shell, and acting instead of feet and oars.

Müller's Ani. Infus.

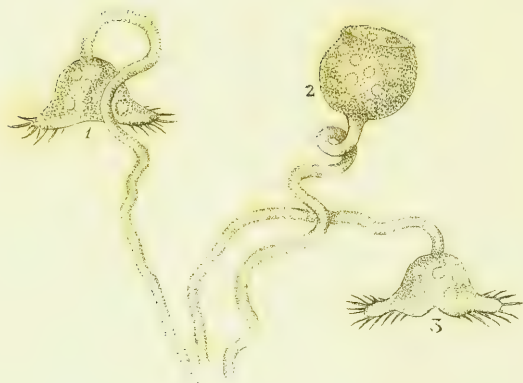


PLATE VIII.

VORTICELLA LUNARIS.

GENERIC CHARACTER.

A worm capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Simple, hemispherical, with a twisted pedicle.

“ The small head of this animalculum is crater-form, the margin
“ of the orifice protuberant, ciliated on both sides, the hairs undula-
“ ting, the pedicle eight or ten times the length of the body. As
“ often as the mouth is opened, the pedicle extends itself ; when it
“ is shut, this is twisted up spirally, and their motions are often reite-
“ rated in a short space.

“ FIG. 1. the head, expanded.—FIG. 2. when shut.—FIG. 3.
“ the undulated edge.”

Müller. Ani. Inf.—Adams's Essays on the Microscope.

FIG. 4. found in infusions of hay, and is called *Trichoda Uvula*.



3



P L A T E X V I I .

VORTICELLA URCEOLARIS.

GENERIC CHARACTER.

A small animal, with a vascular cup; the mouth is at one end ciliated, and capable of being contracted; the stem fixed.

SPECIFIC CHARACTER.

Single, with a short tail, and toothed mouth.

This Animalcum is but barely perceptible to the naked eye, appearing as a small white speck; the microscope discovers the external covering to be so transparent, that all the motions of the animal within are perfectly distinguishable. It has a double rotatory instrument, which, however, it can conceal or shew at pleasure; and has also power to protrude the head and tail as at FIG. 1. or to contract them within the external coat or covering, as at FIG. 2.—When the animal intends to display its rotatory instrument, it forces its tail through the hole at the extremity of the outer coat, and affixes it to whatever substance is near; but when it swims, it moves its tail backwards and forwards to assist it.

They are found in river, or stagnant, water.

F I G. III.

TRICHODA VERMICULARIS.

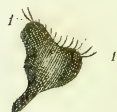
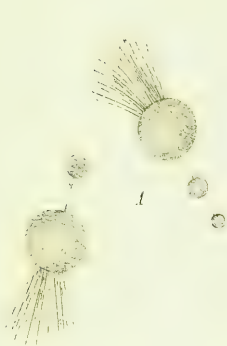
GENERIC CHARACTER.

An invifible, pellucid, hairy worm.

SPECIFIC CHARACTER.

Long cylindrical trichoda, with a fhort neck, the apex hairy.

Is found in river water, and can affume various forms, as fhewn in the annexed plate.



P L A T E XXVI.

F I G. I.

T R I C H O D A C O M E T A.

GENERIC CHARACTER.

An invifible, pellucid, hairy Worm.

SPECIFIC CHARACTER.

Spherical, the fore part hairy, with an appendant globule.

F I G. II.

T R I C H O D A L O N G I C A U D A.

SPECIFIC CHARACTER.

Cylindrical, the first part truncated, and fet with hairs. The tail long, with two joints, and terminated by two bristles.

F I G. III.

V O R T I C E L L A T R O C H I F O R M I S N I G R A.

GENERIC CHARACTER.

A Worm, capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Top-shaped black vorticella.

This species of Vorticella, without the assistance of a microscope, resembles so many small black specks, swimming on the water, particularly in meadows which are inundated. They are constantly in motion; and two small white hooks are perceptible by glasses at 1—1; by the help of those it is supposed to swim, or they may inclose some rotatory organ. The insect is opaque.

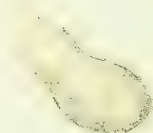


PLATE XXIX.

FIG. I.

TRICHODA MELITEA.

GENERIC CHARACTER.

An invifible, pellucid, hairy Worm.

SPECIFIC CHARACTER.

Oblong ciliated trichoda, with a dilatable neck, the apex globular, and furrounded with hairs. *Müller's Animacula Infusoria*, &c.

Invifible to the naked eye, and rarely found except in falt-waters, although we have met with one fpecimen in the water of the Thames.

FIG. II.

VORTICELLA NASUTA.

GENERIC CHARACTER.

A Worm, capable of contracting or extending itfelf, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Cylindrical, with a prominent point in the middle of the cup. *Müller's Anim. Infuf.*

Is invifible to the naked eye, appears of an unequal fize, before the microfcope is pellucid, with the fore part truncated and ciliated, and moves in the water with great alertnefs, by the affiftance of the circle of hairs which encompaffes the body.

F I G. III.

VORTICELLA VIRIDIS.

GENERIC CHARACTER.

A Worm capable of contracting or extending itself, naked, with rotatory cilia.

SPECIFIC CHARACTER.

Cylindrical, uniform, green, and opaque. *Müller's Anim. Infus.*

The naked eye discovers this species as a mere point : when magnified it is of a dark green colour, almost opaque, nearly cylindrical, obtuse at the extremities, and destitute of limbs. It moves circularly, or in a straight direction, and causes such an agitation of the water, that notwithstanding its appearance, some rotatory instrument must be concealed within the body, which the creature can put forth at pleasure.



PLATE XXXII.

FIG. I.

VIBRIO OLOR.

GENERIC CHARACTER.

An invisible Worm, very simple, round, and rather long.

SPECIFIC CHARACTER.

Elliptical, with a very long Neck, and a knob at the Apex.
Müller's Ani. Inf.

The neck of this Creature is in continual motion, and the whole body is dilatable. It is found in water, replete with decayed vegetables.

FIG. II.

KOLPODA MILEAGRIS.

GENERIC CHARACTER.

An invisible, very simple, pellucid, flat, crooked Worm.

SPECIFIC CHARACTER.

Changeable, with the fore part like a hook, the hind part folded up. *Müller's Ani. Inf.*

FIG.

F I G . I I I . a n d F I G . I V .

P R O T E U S T E N A X .

G E N E R I C C H A R A C T E R .

An invifible, very fimple, pellucid Worm, of a variable form.

S P E C I F I C C H A R A C T E R .

Running out into a fine point. *Müller. Ani. Inf.*

A gelatinous pellucid body, flored with black molecules; it changes its form in a regular order, firft extending itfelf out in a ftrait line, the lower part terminating in an acute bright point, without any intefines, and the globules being all collected in the upper part. It next draws the pointed end up towards the middle of the body, fwelling it into a round form. The contraction goes on for fome time, after which the lower part is fwelled as in Fig. IV. The point is afterwards projected from this ventricofe part. It paffes through five different forms before it arrives at that reprefented at Fig. IV. It fcarcely moves from one fpot, only bending about fide ways. It is to be found in river water, where the *Nitida* grows.—*Adams on the Microfcope.*



P L A T E XLVII.

FIG. I.

PROTEUS DIFFLUENS.

GENERIC CHARACTER.

An invifible, very fimple, pellucid Worm, of a variable form.

SPECIFIC CHARACTER.

Proteus, branching itfelf out in a variety of direCTIONS.

FIG. II.

TRICHODA BOMBA.

GENERIC CHARACTER.

An invifible, pellucid, hairy worm.

SPECIFIC CHARACTER.

Changeable, with a few hairs difperfed on the fore part.

Müller's Ani. Inf.

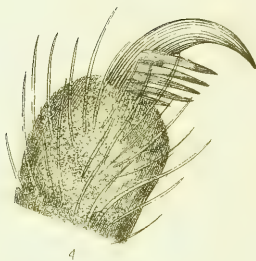
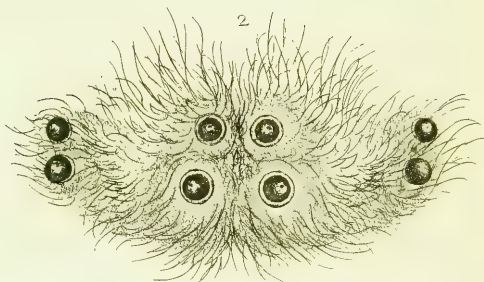
Proteus Diffuens, under fome of its changes appears rather a fhapelefs mafs, than an animated body; it confifts of gelatinous, pellucid fubftance, replete with dark coloured molecules, which either direct or attend, the internal exertions and actions of the animalculum; it pushes forth branches of various fshapes.

Is found in fenny situations, but very rare; the author of the *Ani-
macula Infusoria*, observed it only twice.

TRICHODA BOMBA.

Inconstant as the former, and nearly as difficult to define; it is sometimes spherical, immediately after it will become oval, Kidney shaped, &c. It is very lively, and darts with much velocity; is thick, pellucid, and of a clay colour, or brighter.





P L A T E L.

F I G. I.

The head and thorax, natural size.

F I G. II.

A fragment of the head, with the eyes complete, as it appears when examined by the speculum of an opaque microscope, describing the situation of those organs, in this species of Spider.

F I G. III.

One of its fore claws, natural size.

F I G. IV.

The extremity of the claw magnified. Every foot is constructed after this form.





2



P L A T E XIV.

T R I C H O D A P O C I L L U M.

T R I C H O D A.

An invifible, pellucid, hairy worm.

SPECIFIC CHARACTER.

Oblong trichoda, the fore-part truncated and hairy, the tail articulated, and divided into two bristles.



This invifible animalculum is common in marfhy places, particularly in the fwamps near the banks of the river Thames.

When magnified, the body is pellucid, and appears like two feparate bodies, one enclosing the other; the interior part is filled with molecules, and the exterior is membranaceous: they are capable of extension or dilation, and of folding in various direCTIONS. At the extremity of the interior part is a mufcular orbicular membrane, which is opened or fhut at pleafure, and forms the mouth.

FIG. 1. The interior part protruded with the mouth open.

FIG. 2. The jaws fhut.

3



2



1



4



P L A T E C L I X.

FIG. I, II, III, IV.

ONISCUS AQUATICUS.

APTERA.

No Wings.

GENERIC CHARACTER.

Legs fourteen. Antennæ taper. Body oval

SPECIFIC CHARACTER

AND

SYNONYMS.

Ash colour. Antennæ of four joints. At the end of the tail two bifid appendices.

ONISCUS AQUATICUS: cauda rotundata, stylis bifurcis, antennis quaternis: *Syst. Ent.* 297. 6:—*Spec. Inf.* 1. 376. 6.

Oniscus aquaticus lanceolatus, cauda rotundata, stylis bifurcis. *Linn. Syst. Nat.* 2. 1061. 11.—*Fn. Sv.* 2061.

Squilla Asellus aquatica, cauda rotundata, stylis binis bifurcis. *Degeer Inf.* 7. 496. 1. tab. 31. fig. 1.

Asellus aquaticus *Gesneri.* *Raj. Inf.* 43. 1.

Sulz. Hist. Inf. tab. 30. fig. 12.

Frisch. Inf. 10. tab. 5.

Schaff. Elem. tab. 22.

This species is less frequent than *Oniscus Asellus*, (Common Woodlouse). It lives in clear waters, most part of the summer. It

scarcely exceeds one half of the length of *O. Afellus* in England, yet if we may form an opinion of the German specimens from those figured by *Sulzer*, they are larger than with us.

The *Oniscus Agilis* of *Perfoon*, figured in *Panzer's Work**, corresponds perfectly with ours in size; and the minute markings on the shells, if carefully examined with a glass, will be found nearly alike. The antennæ of the figure in *Sulzer* seems rather contrary to the specific character of the insect; and that of *Panzer's*, though of another species, more resemble those of our specimen.

Of the *Oniscus Afellus* we find different coloured specimens, some are almost white with grey marks, others are nearly deep black; we find also, *Oniscus Aquaticus* liable to variations, though not so much as the former insect, in some the light ground colour is very distinct, in others rather confused. Some are deeper coloured; and again, many, when first taken, have a fine glowing, olive brown appearance throughout, though less vivid than that of *Oniscus Agilis* before noticed.

Fig. 1. 2. Natural size. Fig. 3. Magnified. Fig. 4. Antennæ.

* *Faun. Inf. Germ.*



P L A T E C C V I I .

JULUS TERRESTRIS.

APTERA.

GENERIC CHARACTER.

Lip crenate, and emarginate: antennæ moniliform: feelers two filiform: body long femicylindrical, consisting of numerous transverse segments: legs numerous, twice as many each side as there are segments of the body.

SPECIFIC CHARACTER

AND

SYNONYMS.

Feet 100 each side.

JULUS TERRESTRIS: pedibus utrinque 100. *Linn. Syst. Nat.* 2. 1065. 3.—*Fn. Sv.* 2066.—*Fab. Ent. Syst.* I. 2. 394. 8.
Degeer Inf. 7. 578.
Geoff. Inf. 679. 1.
Frisch. Inf. 2. tab. 8. fig. 3.
Sulz. Inf. tab. 24. fig. 156.
Sulz. Hist. Inf. tab. 30. fig. 15.

This singular creature is found of a vast magnitude in foreign countries. We possess one of that kind between four and five inches in length. In Europe, or at least in England, they are seldom considerably larger than the annexed figure.

It has two pair of feet to every segment of the body. These are very minute, but give a remarkable appearance to the Insect. It is found in damp places, generally under stones.

THE HISTORY OF THE

REIGN OF

CHARLES

THE FIRST

OF GREAT BRITAIN

AND IRELAND

BY

JOHN

WILKINS

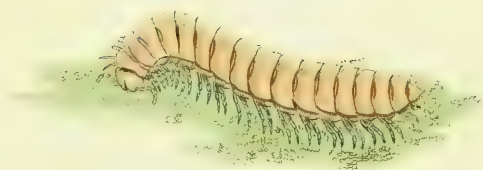
OF THE

BAR

AT

WINDSOR

PRINTED



P L A T E C C C X L I V .

JULUS COMPLANATUS.

GENERIC CHARACTER.

Feet numerous. Twice as many on each side as the segments of the body. Antennæ moniliform. Palpi two, articulated, body semicylindrical.

SPECIFIC CHARACTER

AND

SYNONYMS.

Antennæ clavated. Body flat. Tail acute.

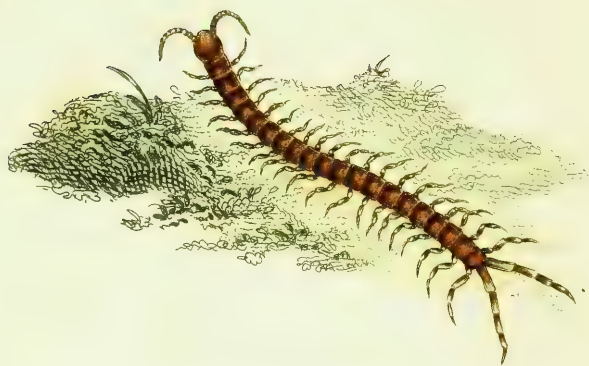
JULUS COMPLANATUS : pedibus utrinque 30, corpore planiusculo, antennis clavatis. *Linn. Syst. Nat.* 2. 1065. 4. — *Fn. Sv.* 2068.

JULUS COMPLANATUS : pedibus utrinque 30, corpore planiusculo, cauda acuta. *Fab. Ent. Syst.* 2. p. 393.

Fabricius as well as Linnæus considers the number of feet as an essential part of the specific character throughout this genus. Both are certainly mistaken in assigning thirty feet to each side of this creature. Degeer mentions thirty-one; and in an unmutated specimen we have, two legs may be perceived at every joint except those nearest the head. The body is flat, the shields slightly scabrous, and the antennæ clavated, the last we deem more characteristic than the number of the feet.

This very curious creature is local, being rare in most places.





P L A T E CCCCLXXV.

SCOLOPENDRA HORTENSIS.

GARDEN CENTIPEDE.

APTERA.

GENERIC CHARACTER.

Antennæ fetaceous : feelers two, filiform, and united between the jaws : lip toothed and cleft : body long, depressed, consisting of numerous transverse segments : legs numerous.

SPECIFIC CHARACTER.

SCOLOPENDRA HORTENSIS : fuscous ; legs on each side twenty-one.



This Centipede appears to be of an undescribed species : it was discovered, in some abundance, by Mr. W. Leach, in the gardens at Exeter.

The natural size of this insect is delineated in the lower part of the annexed plate ; and from this it will be observed, that the species is of the more diminutive kind. In its general aspect it bears a very strong analogy to the great venomous Centipede of the eastern parts of the world, Scolopendra moritans. The resemblance is indeed so striking, that notwithstanding the disparity of size, were it not for the present species differing, in having a pair of legs more than that insect, we should not be inclined to think it specifically distinct. The number of legs in the Scolopendra genus is admitted by entomological writers

writers as a criterion of the species, and for this reason it is submitted as a new insect.

The figure in the upper part of the plate exhibits its magnified appearance.



P L A T E CXCVIII.

SCOLOPENDRA FORFICATA.

APTERA.

WITHOUT WINGS.

GENERIC CHARACTER.

Antennæ setaceous: feelers two, filiform, united between the jaws: lip toothed and cleft: body long, depressed, consisting of numerous transverse segments: legs numerous, as many on each side as segments of the body.

SPECIFIC CHARACTER

AND

SYNONYMS.

Feet fifteen on each side.

SCOLOPENDRA FORFICATA: pedibus utrinque 15. *Linn. Syst. Nat.*

2. 1062. 3.—*Fn. Sv.* 2064.—*Geoffr. Inf.* 2. 674. 1.

—*Fab. Spec. Inf.* 2. 532. 3.—*Ent. Syst.* 2. 390. 4.

Scolopendra rufo fusca, pedibus utrinque 15. *Degeer Inf.* 7. 557. 1.
tab. 35. *fig.* 12.

Sulz. Inf. tab. 24. *fig.* 155.

Schæf. I. pl. 46. 12.

This singular creature not only changes its skin several times; but, as it advances in age, the segments of which the body is composed increase in number: the Insect when full grown has nine such segments. Linnæus mentions it as a native of America: in many

E

parts

parts of Europe it is not uncommon : in England it is found under loose stones in damp places, and runs swiftly.

Fabricius has made a false quotation under this species to the *Fundamenta Entomologica* of *Schæffer*; as errors will occur in the most accurate work, we should not deem it necessary to notice this circumstance, if he had not continued the same mistake from his *Species Insectorum* published in 1781 to his last work *Entomologia Systematica, emenda et aucta, &c.* published in 1793.—his reference is *Schæf. Elem. tab. 3. fig. 1.* and on examining that part of *Schæffer's* works, we find the figure he quotes is a spider *Scolopendra forficata* is given in the 46th plate of Vol. I. of that author's *Icones Insectorum circa Rastisbonam indigenorum, &c.* as quoted amongst the synonyms above.

The *Scolopendra forficata* is, we believe, the largest of the genus found in this country. In many parts of the world, some kinds are found of a frightful size and aspect; the *Scolopendra Morbitans* of the East-Indies, is about five inches in length, and as thick as a goose quill. Sir G. Staunton, in his *Historical Account of the Embassy to China*, mentions the *Scolopendras* and scorpions of that country: we have one species of the former from China that exceeds in magnitude every one of the genus we have seen from other parts of the world, and is perhaps the largest known; it is near one foot in length, and is about one inch and an half round the girth of the body; the colour is of a fine shining chestnut brown, the legs inclining to yellow. The most singular Insect of this kind in England is the *Scolopendra electrica*, which sometimes emits a spark or flash of light in the dark.

Fig. I. represents the under side of the head and antennæ, magnified.



P L A T E CCXV.

PHALANGIUM CANCROIDES.

APTERA.

GENERIC CHARACTER.

Mouth with horny mandibles, the second joint with a very sharp moveable cheliform tooth: feelers filiform; no antennæ: eyes two on the crown and two at the sides; legs eight: abdomen usually rounded.

SPECIFIC CHARACTER

AND

SYNONYMS,

Body obovate, and depressed: claws smooth, hairy at the ends.

PHALANGIUM CANCROIDES: abdomine obovato depresso, chelis lævibus: digitis pilosis.—*Lin. Syst. Nat.* 2. 1028. 4.
—*Fn. Sv.* 1968.

SCORPIO CANCROIDES: abdomine ecaudato ovato depresso fusco, manibus oblongis.—*Fab. Ent. Syst. T.* 2. 436. 10.

Chelifer abdomine lineis transversis.—*Geoff. Inf.* 2. 618. 1.

Chelifer europæus obscure fuscis corpore ovato depresso, chelis elongatis.—*Degeer. Inf.* 7. 355. 2. tab. 9. fig. 4.

Roef. Inf. 3. tab. 64.

Frisch. Inf. 8. tab. 1.

Schæff. Elem. tab. 38.

The synonyms sufficiently denote the unsettled opinion of eminent naturalists in respect of the proper genus to which our Insect should be referred. We have followed the definition of Linnæus, because
it

it appears to us more characteristic of the creature, which should have a lengthened articulated tail, terminated in a sharp crooked sting, to warrant us in placing it among the Scorpions. In the system of Fabricius this forms no part of his generical character, but those who are accustomed to depend only on the writings of Linnæus, would be perplexed to reconcile the apparent difference between the Phalangium of that author, and the Scorpio of Fabricius.

The general appearance of this creature, except the want of tail, is precisely that of a Scorpion in miniature.

Mr. Adams, in his Essay on the Microscope, has figured and described a new species of this genus; it is smaller, and differs in form from our present species; he calls it the Lobster Insect. We believe Phalangium Cancroides is the largest Insect of the genus that resembles a Scorpion, and is found in England.

This Insect is sometimes found in the covers of old books, in rotten wood, and other damp and decayed substances. We once found it fastened on the body of the *Musca Vomitoria*, (Common Flesh Fly,) from which it could not be extricated without killing and tearing the fly into pieces.

Roefel has given a figure of it, and represented a parcel of its eggs. They are of an oblong form, colour greenish, and appear to be deposited in roundish clusters of about thirty or forty eggs in each.

The natural size of our Insect is represented at Fig. 1.



P L A T E XLIX.

A R A N E A D I A D E M A.

WHITE CROSS, SPIDER.

APTERA.

No wings.

GENERIC CHARACTER.

Legs eight. Eyes eight.

SPECIFIC CHARACTER.

Abdomen gibbous, red-brown, with white spots in the form of a cross.

Syst. Ent. 434. 13.—*Linn. Syst. Nat.* 2. 1030. 1.
—*Fn. Sv.* 1993.

ARANEA cruciger.—*Degeer. Inf.* 7. 218. 1. *Tab.* 11. *Fig.* 3.

ARANEA Linnæi.—*Scop. carn.* 1077.

Mouff. Inf. 233. *Fig.* 1.

Aldrov. Inf. 608. *Fig.* 9.

Tonst. Inf. Tab. 18. *Fig.* 17. 19. 20.

Raj. Inf. 18. 2.

List. Aran. Fig. 2.

Frisch. Inf. 7. *Tab.* 4.

Clerk. Aran. Tab. 21. *Fig.* 2.

Schaeff. Elem. Tab. 21. *Fig.* 2.

——— *Icon. Tab.* 19. *Fig.* 9.

The Genus *Aranea* includes a vast, if not endless variety of species, and though the greatest dissimilarity may be observed as to size, proportion, or colouring, of many individual kinds, yet the rapaciousness

common to the family, is apparent in all. Our domestic Spiders are plain in their colours, and seldom attain a very extraordinary size; the gardens are infested by species somewhat larger, and more lively in their marks and tints, but if we wish to trace the just gradations of the beauty, or size, of those detestable creatures, the forests abound; and will afford the highest gratification to the enquiries of the naturalist. We have Spiders purely white, or white stained with a lovely green; yellow, marked with a vivid red; purples shaded with the richest hues, and the brightest browns, bespangled with the utmost elegance and symmetry: Yet under those rich adornments which nature has so profusely bestowed on this complication of beauty, and ferocity, we discover inherent qualities, which, in larger animals, would become formidable, and though we feel confident of our superiority over the insidious art of such a contemptible creature, yet the mind is susceptible of an inward abhorrence at its touch, which neither the expansion of philosophy, or ignorance of its disposition, will sometimes suppress. It is probable, that *Thomson*, in his description of the Spider, felt this sympathy of the human mind,

“ ——— To heedless flies the window proves
A constant death; where, gloomily retired,
The villain Spider lives, cunning and fierce,
Mixture abhorr'd! Amid a mangled heap
Of carcases, in eager watch he sits,
O'er-looking all his waving snares around.
Near the dire cell, the dreadful wanderer oft
Passes, as oft the ruffian shews his front;
The prey at last ensnar'd, he dreadful darts
With rapid glide along the leaning line;
And fixing in the wretch his cruel fangs,
Strikes backward grimly pleas'd: the flutt'ring wing,
And shriller sound declare extreme distress,
And ask the helping hospitable hand.”

Early in the spring we find the nests of Spiders in the crevices of old walls, trees, and other obscure places. They are enclosed in webs of a white, yellow, or grey colour, varying according to the species;

species; immediately that the warmth of the sun has hatched them, they disperse, it being no longer necessary to live in societies, which indeed, would deprive some of their subsistence.

In February we took a nest of minute yellowish eggs, which proved to be the infant offspring of the *A. Diadema*, they scarcely exceeded the size of a pin's head when hatched, and were of a bright yellow colour; at first their food was the common house fly, but their increase in bulk was so rapid that it was necessary to destroy many, to preserve a few; we therefore selected four specimens, which being fed in separate glasses, and on different insects, exhibited each a distinct degree of strength, and colour. One specimen destroyed thirty of the common house fly in a day; it then appeared much enlarged, and the colours were almost black, except the spots of white, which sparkled with infinite lustre; but being confined a week without a fresh supply, its colours were considerably faded; another week of abstinence reduced its colours to a pale uniform brown, the body was much wasted, and the creature became perfectly ravenous. It devoured a vast quantity of food, and recovered much of its former colours a few hours after.

Our largest Spiders are incomparable for their size, or venomous qualities, to the productions of America, or of the eastern countries; in Germany they are far superior in size to our specimens, but in Surinam they are infinitely surpassed, Spiders of those parts being often found with legs as thick as a goose-quill, and three or four inches in length, which with difficulty support a body as large as a pullet's egg. Their snares are commonly extended from one branch of a tree to another, covering the space of twenty or thirty feet, and is sufficiently strong to entangle the largest insects. A. Seba has figured a Spider of this description, as descending from an arm of a tree, into the nest of a small species of Humming Bird, to suck the blood of the parent, and eggs.

"The eyes of the Spider are a very beautiful microscopic object, viewed either as transparent or opaque; they have generally eight, two on the top of the head, that look directly upwards; two in the front, a little below the foregoing, to discover what passes before it; and on each side a couple more, one whereof points sideways forward, the other sideways backward; so that it can see almost all around it. They are immovable, and seem to be formed of a hard, transparent, horny substance. The number of eyes is not the same in all the species of the

Spider. They have eight legs, with six joints, thickly beset with hairs, and terminating in two crooked moveable claws, which have little teeth like a saw; at a small distance from these claws, but placed higher up, is another, somewhat like a cock's spur, by the assistance of which it adheres to it's webs; but the weapon wherewith it seizes and kills its prey is a pair of sharp crooked claws, or forceps, placed in the fore-part of the head. They can open or extend these pincers as occasion may require; when undisturbed they suffer them to lie one upon another. Mr. *Leuwenhoeck* says, that each of these claws has a small aperture, or slit, through which he supposes a poisonous juice is injected into the wound it makes.

“ The exuvia of the Spider, which may be found in cobwebs, being transparent, is an excellent object; and the fangs, or forceps, may be easier separated from it, and examined with more exactness than in a living Spider. The contexture of the Spider's web, and their manner of weaving them, have been discovered by the microscope. The Spider is supplied with a large quantity of glutinous matter within it's body, and five dugs, or teats, for spinning it into thread. This substance, when examined accurately, will be found twisted into many coils, of an agate colour, and which, from its tenacity, may be easily drawn out into threads. The five teats are placed near the extremity of its tail; from these the aforesaid substance proceeds; it adheres to any thing it is pressed against, and being drawn out, hardens in the air. The Spider can contract or dilate at pleasure the orifices through which the threads are drawn. The threads unite at a small distance from the body, so that those which appear to us so fine and single, are notwithstanding composed of five joined together, and these are many times doubled when the web is in formation.”

The Spider parallels design,
Sure as Du Moivre, without rule or line.

POPE.





PLATE CCCCXXVII.

FIG. I. I.

ARANEA LIVIDA.

APTERA.

GENERIC CHARACTER.

Mouth with short horny jaws: lip rounded at the tip: feelers two, incurved, jointed, and acutely pointed, those of the male clavated and furnished with the sexual organs: antennæ none: eyes eight or rarely six: legs eight: papillæ for spinning at the tip of the abdomen or vent.

Section eyes

SPECIFIC CHARACTER.

ARANEA LIVIDA: thorax subtriangular: abdomen ovate; above brown, obscurely dotted, and lineated with blackish: beneath testaceous.

A specimen of this remarkable species of Aranea occurs in the cabinet of the late Mr. Drury, with a memorandum relating the following particulars of its capture.—“ This spider was taken out of the water at Hornsey wood, October 4th, 1766, being in company with Mr. Rice.”

The figures, which shew both the upper and lower surface of this gigantic spider, sufficiently exemplifies its magnitude and general aspect, being represented in its natural size. The prevailing colour of the upper surface is darker than the lower; it is a livid brown faintly variegated with reddish. On very close inspection, the thorax appears to be obscurely lineated and dotted with blackish, radiating from the ridge of the back, as from a center towards the outer margin: the legs also are lineated with about four or five equidistant blackish lines sprinkled with a few dots, slightly hairy, and sparingly beset with small fetiform spines: the abdomen rather downy.

The eyes of this spider, eight in number, are disposed on the anterior part of the thorax in a singular manner: the four anterior ones form a transverse curved line, behind which are two contiguous eyes of a similar size, and a little farther behind two more; but the last are placed much more remotely from each other than the former. Those posterior eyes are distinguished likewise by being stationed each upon the summit of a rather large smooth lateral tubercle of a rufous colour. The exterior eye on each side in the anterior line, it should be observed, is seated on a similar smooth rufous tubercle, but which is of a diminutive size compared with those on which the posterior eyes are situated.

As there is no species of the family to which this spider belongs among those already described by Linnæus, Fabricius, or any other entomological author within our knowledge, that corresponds with our present insect, we consider it as a new species.

FIG. II.

ARANEA MARGINATA.

SPECIFIC CHARACTER.

ARANEA MARGINATA: brown: thorax and abdomen furrounded with a whitish line.

ARANEA PALUSTRIS: *Linn. Syst. Nat.* 12. 2. p. 1036. n. 41.
—*Var.?*

ARANEA TRILINEATA: *Fabr. Ent. Syst. T.* 2. p. 423. n. 61?

Aranea pugnax: *Rofs. Fn. Etr.* 2. 135. 980?



This insect agrees very nearly with the *Aranea trilineata** of Fabricius, and does not appear very remote from the Linnæan description of *Aranea palustris*†. The principal difference consists in the position of the eyes, which constitutes an essential characteristic mark of the several families into which the *Aranea* genus is divided; and in this particular they are very distinct. Admitting therefore, that Linnæus and Fabricius are correct in describing the situation of the eyes in the two insects above-mentioned, we must consider the present insect as a species distinct from either, notwithstanding their similarity in other respects. It does not certainly agree with the description of

* *Aranea Trilineata*: fusca thoracis margine linea dorsali margineque ovato cinereis.
Fabr. Ent. Syst. T. 2. p. 423. n. 61. oculis :: ::

† *Aranea Palustris*: fusca, thorace abdomineque utrinque linea nivea. *Linn. Syst. Nat.* 12. 2. p. 1036. n. 41.

any species of *Aranea* in the same family hitherto described by those writers. It may therefore be a nondescript species, though we must at the same time confess, we conceive it not unlikely, that the position of the eyes in the *Aranea trilineata* of Fabricius has been mistaken by that writer, and that it may hereafter prove to be the same species.



P L A T E CLVI.

FIG. I.

ARANEA EXTENSA.

APTERA.

No Wings.

ARANEA.

SPECIFIC CHARACTER

AND

SYNONYMS.

Abdomen long, greenish, and silvery. Legs very long.

ARANEA EXTENSA: abdomine longo argenteo virescente, pedibus longitudinaliter extensis. *Linn. Syst. Nat.* 2. 1033. 22. *Fn. Sv.* 2011.

Aranea retiara abdomine elongato griseo fusco, pedibus longitudinalibus extensis.

Degeer. Inf. 236. 1.

Geoff. Inf. 2. 642. 3.

List. Aran. fig. 3.

Raj. Inf. 19. 3.

This species is particularly distinguished by the length and position of its legs. It runs very fast. Our specimen was taken on an oak, and we do not think it is a ground Spider.

Found in Darent wood, Dartford, in August.

FIG.

FIG. II.

ARANEA GLOBOSA.

GLOBULAR SPIDER.

APTERA.

GENERIC CHARACTER.

Legs eight. Eyes eight.

SPECIFIC CHARACTER

AND

SYNONYMS.

Black. Abdomen globular, sides crimson.

ARANEA GLOBOSA: nigra abdominis lateribus fanguineis. *Fab.*
Ent. Syst. 2. 411. 15.

We have met with this beautiful Spider several times in Caenwood. It was commonly seen on the young oaks. One being confined in a box spun a small web, of a very flight texture. Found in May and June.

FIG. III.

ARANEA CINEREA.

APTERA.

ARANEA.

SPECIFIC CHARACTER

AND

SYNONYMS.

Abdomen ash colour, or grey. Thorax and feet yellow-brown.

ARANEA CINEREA: abdomine cinerascens: Thorace pedibusque
testaceis. *Panzer.*

Die aschgrau Spinne. *Panz. Inf. German.*

Aranea Cicurea, pallide rubra abdomine ovato cinereo. *Fab. Ent.*
Syst. 2. 410. 12?

A common Spider in woods. Found in May and June.

F I G. I V.

P H A L A N G I U M B I M A C U L A T U M.

M I N U T E B L A C K S P I D E R, W I T H T W O W H I T E S P O T S.

A P T E R A.

N o W i n g s.

G E N E R I C C H A R A C T E R.

L e g s e i g h t, e y e s t w o. A b d o m e n r o u n d e d.

S P E C I F I C C H A R A C T E R

A N D

S Y N O N Y M S.

Very minute. Entirely black, except two white spots on the Thorax.

P H A L A N G I U M B I M A C U L A T U M: abdomine atro : maculis duabus albis. *Fab. Ent. Syst. v. 3. n. 8. p. 431.*

Die zwey fleckigte Afterspinne. *Panz. Faun. Inf. Germ.*

This is a very minute Insect; the figure is more than twice the natural size. It was found amongst a great variety of other spiders, in Darent wood, Dartford, about the middle of August.



P L A T E X I.

A C A R U S C O L E O P T R A T O R U M.

BEETLE-TICK.

APTERA.

No wings.

G E N E R I C C H A R A C T E R.

Legs eight. Eyes two, lateral. Tentacula two, jointed.

S P E C I F I C C H A R A C T E R.

Tawny. Anus whitish.

Syst. Ent. 814. 24. *Linn. Syst. Nat.* 2. 1026. 27. *Fn. Sv.* 1973.

This Tick is one of those detestable race of animals whose minuteness secures it from danger, while it draws nutriment from the blood, and frequently from the vitals of larger insects. Every animal is tormented by those cruel and blood-thirsty beings, varying in size, in shape, and in colour, but whether they be distinguished by the name of lice, bugs, fleas, or mites, they fall under one point of view, when considered as a pest to the societies of other animals. In a scientific arrangement they must of course be regarded as generically different.

Beetles are in general infested and severely injured by those vermin. I found about a month since one of the *Scarabæus Stercorarius*, Com-

mon Der, or *Clock*, almost devoured alive by them, little except his shell remaining; yet, in this state, it lived several days. There were a number of small brown bags affixed by pedicles to its breast, thighs, and even feet; the microscope discovered those to contain each an embryo, and the pedicle, seemed to answer the part of an umbilical chord, to extract nourishment from the living creature. I perceived on further inspection their base penetrated the shell, or entered the apertures.

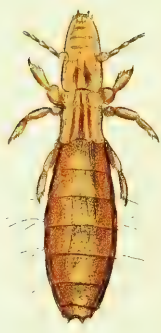
FIG. 1. Natural size of the Ticket and Embryo.

FIG. 2. The upper side, and Fig. 3. under side, magnified.

GRADUAL, from these what-numerous kinds descend,
 Evading even the microscopic eye!
 All Nature swarms with life; one wond'rous mass
 Of Animals or Atoms organized,
 Waiting the vital breath, when PARENT HEAVEN
 Shall bid his Spirit blow. — — — — —

— — — — — These, conceal'd
 By the kind art of forming HEAVEN, escape
 The grosser eye of man: for, if the worlds
 In worlds inclos'd, should on his senses burst,
 From cates ambrosial, and the nectar'd bowl
 He would abhorrent turn: and in dead night
 When silence sleeps o'er all, be stunn'd with noise.

THOMSON'S SEASONS



P L A T E C C X C I .

P E D I C U L U S C O L U M B Æ .

P I G E O N ' S L O U S E .

A P T E R A .

G E N E R I C C H A R A C T E R .

Beak retractile, and recurved : feelers none : antennæ length of the thorax : eyes two : abdomen depressed, and sublobate : feet six, formed for climbing.

S P E C I F I C C H A R A C T E R

A N D

S Y N O N Y M S .

Body slender, thickest towards the end, whitish, with a ferruginous line on each side.

P E D I C U L U S C O L U M B Æ : corpore filiformi ferrugineis postice clavato.

Fab, Syst. Ent. 809. 31.

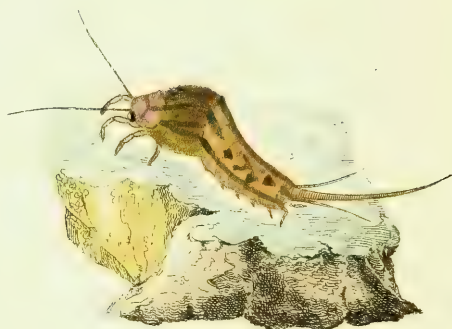
Pediculus oblongus filiformis albicans, corporis lateribus utrinque ferrugineis. *Geoff. Inf.* 2. 599. 7.

Pulex Columbæ Majoris. *Redi de Insectis tab.* 2. fig. 1.

This is the kind of Louse found on the common Pigeon. It differs specially from those of other Birds and Animals, as the significant appellation *Pediculus Columbæ* implies.

It is supposed that almost every creature has its peculiar species of Pediculus, but no more than fifty distinct species have been hitherto ascertained; and nearly the whole of these belong to the feathered tribe. *Redi*, *Linnaeus*, *Fabricius*, and other Authors distinguish many of the Pediculi by the names of those creatures which they infest, as *P. Vulturis*, *Orioli*, *Cuculi*, *Cygni*, *Pavonis*, *Phasiani*, &c. &c.

FIG. I. Natural Size. FIG. II. Magnified,



2



1

P L A T E CLXII,

F I G. I, II.

LEPISMA POLYPODA.

APTERA,

No Wings.

GENERIC CHARACTER.

Legs six, broad and scaly at their origin. Palpi two, moveable. Antennæ filiform. Tails three. Body scaly.

SPECIFIC CHARACTER

A N D

SYNONYMS.

Grey, brown, black intermixed; a very high protuberance on the back. Three tails.

LEPISMA POLYPODA: saltatoria, cauda triplici, abdominis segmentis subtus utrinque villosis. *Fab. Spec. Inf.* 1. 380. 2.

Lepisma polyпода scutata, cauda triplici. *Lin. Syst. Nat.* 2. 1012. 2.

Forticina teres saltatrix. *Geoff. Inf.* 2. 614. 2.

Lepisma squamosa saltatoria, setis caudæ tribus intermedia majore. *Stræm. Act. Hafn.* 9. 575. tab. 2.

Fig. 1. The natural size. Fig. 2. Magnified.

This is a very rare and curious species; it was found amongst some loose stones, in a damp situation, July, 1796.

